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Characteristics of Post-traumatic Stress Disorders Following the Earthquake in Armenia

One can confidently say that before the tragedy in Chernobyl and the disastrous earthquake in Armenia, the term *post-traumatic stress disorder* was practically nonexistent in Russian-language psychiatric literature. These two disasters first drew the attention of Russian-language psychiatrists to this problem, although one cannot say that they had totally ignored the mental aspects of the consequences of such disasters. One of the first to call attention to mental disorders following earthquakes was N.N. Bazhenov [8], who termed the mental symptoms occurring after the Messina earthquake in 1908 "a horror affect," which also included hysterical disorders. After the Crimean earthquake, "acute nervous diseases" and "a considerable deterioration in the state of the nervous system and the mind," consisting of signs of shock-induced affective and hysterical psychoses, were described among a considerable proportion of the victims [11]. Mental disorders following earthquakes were studied after the Tashkent earthquake in 1969 as well [40]. However, none of these investigators used the term *post-traumatic stress disorder* to describe these mental disorders.

The very first studies devoted to the problem of disasters already suggested that mental reactions to natural disasters have distinctive features, perhaps are even quite specific. The term *disaster syndrome* was introduced [58]: apathy, passivity, and a tendency toward aimlessness develop in the victims as a result of general disorganization. Later, hypersuggestibility and altruism begin to dominate their behavior, and this is followed by a strengthening of a sense of collectivism and euphoria, and former grief is forgotten. In the last stage of development of the syndrome, there is a return to normal life activity; and the victim becomes fully conscious of the loss and damage suffered.

A group of mental disorders that DSM-I (1952) designated "major stress reaction" was described on the basis of observations made during the military hostilities of the American army in Korea. These disorders were defined as states that occur in situations in which the individual is subject to considerable physical hardship or marked emotional stress. The DSM-II (1968) classifies analogous disorders as "transitory situational disorders." Post-traumatic stress disorder (PTSD) was introduced as a separate diagnostic category in DSM-III-R (1987). This concept is grouped with similar psychopathological disorders in people who have undergone disasters and suffered serious material and/or moral losses [43]. The term *PTSD* covers the entire range of the diverse clinical-psychopathological aspects of responding to a disaster.

Studies devoted to an analysis of battle trauma and a wartime situation contributed to the development of the concept of PTSD. Work on this problem was stimulated by the USA intervention in Vietnam [46,49]. Earlier, E.K. Krasnushkin [27] described diagnostic categories that were typical for combat: "traumatic battle neurosis," "battle fatigue," and "pain exhaustion." And even earlier, such disorders had been identified by Bleuler [10] and Kraepelin [28] under the designations "traumatic neurosis" and "fright neurosis."

The problem of PTSD attracts the attention of specialists for the following reasons. First, the development of civilization gives rise to the possibility of major, even global, disasters, before which, however, we are helpless, and will remain so, at least in the near future. Second, the problem is of tremendous practical significance in that PTSD is becoming increasingly common, creating certain difficulties in diagnosis, treatment, and rehabilitation of the victims. Third, there are at present no theoretical concepts that can provide guidelines on how to approach study of the psychological and neurobiological mechanisms of the development of PTSD [12].

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Earthquakes have the greatest mentally traumatizing impact of all the natural disasters. About 10,000 people die every year throughout the world as a result of them, and the trend toward concentration of the population in cities is increasing the risk of mass losses [34]. This risk increases incommensurately for whole regions and countries that are located wholly within zones of potentially great seismic activity.

The present review is based mainly on studies of the earthquake in Armenia (1988). The catastrophic destruction, unprecedented in scale, extended over almost one-third of the territory and the population of that small republic; this earthquake was one of those natural disasters capable of causing "a pandemic of neuropsychiatric traumatism" [11]. Severe injuries, prolonged compression of various parts of the body, wounds, contusions, burns, and also other, usually compound, traumas were characteristic of the victims.

The problem of mental disorders under extreme conditions or of PTSD presents a number of practical and theoretical tasks (planning and organizing psychiatric care for the population that has undergone an earthquake, on the one hand, and modeling different mental responses to an similar effects from any extreme situation, on the other) [16]. The psychological aspect of the problem involves people's reactions to the disaster regardless of whether they are normal or pathological. Mental losses, i.e., the magnitude, structure, and dynamics of strictly psychopathological disorders, and ways to prevent them have been studied separately [21,22,31,52].

The acute, stressful, life-endangering situation caused by an earthquake in many respects blurs personal distinctiveness, paving the way for quite monotypical, primitive, defensive, psychogenic, shock-related affective reactions directly as the disaster is occurring. Two sources of psycho-emotional tension are observed in the development of these reactions: (*1*) the loss of relatives and loved ones, solitude, lack of shelter, disablement, losing hope that one's emotional and physical wounds can be cured;and (*2*) permanent immersion in a state of distress, i.e., constant expectation of a new and strong shock. This situation disrupts the bio- and socio-psychological integrity of the individual, and is attended by numerous neuropsychiatric and psychosomatic sensations [24,25]. In the works cited, the authors focus their attention mainly on the individual ways people who have experienced natural disasters respond; but the role and the significance of collective trauma are also emphasized [21]. Such trauma is associated with the

destruction of stable and permanent bonds, the loss, or threat of loss, of a sense of community. The effect of collective trauma becomes evident a year later in the form of growing apathy, demoralization, disorganization, and withdrawal from the presence of others. The social environment provides no protection or support, changes a person's view of the world, and creates a sense of loss of one's own self. The distinctive features of collective trauma are closely linked to the cultural and ethnic characteristics of the body social (tradition, social, family, and kinship ties, etc.) [21]. All works devoted to study of the mental pathology resulting from an earthquake may be divided into three groups: (*1*) the phenomenology of extreme situations; (*2*) the epidemiology of mental disorders; and (*3*) the organization of specialized care, prevention, and treatment of mental disorders. The phenomenology of psychopathological disorders is represented in the present article by an analysis of works on the medical aspects of the consequences of the Armenian earthquake in December 1988. "Pure" symptoms of mental trauma and compound symptoms, i.e., mental disorders against a background of physical disorders and preexisting mental disorders, are identified.

The distinctive features of the clinical symptoms in earthquake survivors depend to a certain extent on the specifics of the mentally traumatizing events. One may distinguish between disorders in people who have survived a direct threat to their lives and those exhibited by people who have not experienced such a threat. The former were found to have psychogenic reactions that succeeded one another in a definite sequence: emotional shock, motor inhibition, motor excitation, confused speech, and regressive reactions. Most of these reactions were abortive. The second group featured a heightening of anxiety level accompanied by autonomic reactions [16].

Depressive asthenic, anxious, psychosomatic, psychopathoid, and hysteriform disorders, an accentuation of personality features, and somatiform mental disorders combined with autonomic vascular and phobic symptoms were the most frequently observed following the disaster [13,18,26,31,36]. The clinical picture was reduced to a small number of quite typical symptoms [4]. All essentially psychogenic disorders boiled down, from a clinical standpoint, to two basic types: (*1*) psychogenic reactions and states (nonpsychotic mental disorders in ICD–9) and (*2*) reactive psychoses [24,25]. Similar states have been observed as a consequence of many other earthquakes [8,40].

On the basis of our analysis of the works presented in this review, we may distinguish three periods in the formation and development of mental disorders: acute, subacute, and chronic [1,4,23,37,54]. The first (acute) period lasted from several hours to 10–14 days [1,25,37]. In this period disorders were found in 75%–90% of earthquake survivors. They took the form of varied symptoms, anxious-phobic reactions and affects of fear predominating, which were detected in 88% of the people examined and most often were the first reaction to the disaster [1,23,31,37]. Simple, complex, and psychotic forms of these reactions were distinguished (physiological, borderline, and psychotic), prominence of which was determined by quantitative and qualitative disorders of consciousness [5].

The general patterns of people's responses to acute, severe mental trauma were called "stress syndromes"; two key concepts, "immersion" and "avoidance," were defined as factors in the development of such syndromes [47]. In the immersion phase, most of the victims had typical experiences in the form of obsessive ideas and thoughts, emotional distress, sleep disorders, and nightmares. States that appeared outwardly to be just the opposite of these were noted: these involved denial of what had taken place, selective inattention, amnesia, and indifference (the avoidance phase). The two phases could alternate; they gradually diminished in intensity until some balance was struck with the traumatizing situation. The type of response was determined by personality traits, age, and certain other factors. Three periods marked the development of a stress syndrome [25,56]. During the period of distress, 75% of the people were distraught and emotionally paralyzed and displayed semi-automatic behavior; 10%–25% were confused and were in a state of motor stupor and fear. All this lasted from the moment the destructive forces began until they ended. In the second period of recoil, the threat of death is eliminated, the victims become aware of what has happened, and they regain their capacity for emotional response. In the third post-traumatic period, when safety has returned again, the victim evaluates what has taken place. Anxious-depressive and phobic experiences are evident. The three components we defined earlier [37] are discernible in the structure of the clinical symptoms of these periods: these are the relation of the personality of the victims to the catastrophe, psychomotor responses observed during it, and the psychophysical state of those who have undergone acute mental trauma. The principal types of reaction on the neurotic level were

depressive, asthenic, phobic, obsessive-phobic, hysterical, and hypochondriacal [2,17,23,27], a subshock stupor, and fugiform reactions [40].

The second (subacute) period lasted up to six months [37], and was observed in 30%–40% of the survivors. According to some findings, this period can last up to three to four years [1]. The clinical picture of this period was defined by the formation of neurotic (neurosislike) states [23]. As time passed after onset of the earthquake, considerable changes in the structure, prominence, and frequency of mental disorders were observed. Varied psychiatric reactions of a neurotic or psychotic type enter a stage in which these reactions acquire a structure [17]. In the acute period, the earthquake affects deeply vital instincts and leads to the development of nonspecific, impersonal psychogenic reactions based on fear of varying intensity, especially during the first few hours. In the second period, "normal life under extreme conditions" begins [4]. Personal forms of reacting assume an important role [33]. The mental disorders of this period formed against a background of asthenia, and were characterized by astheno-depressive, anxious-phobic, hypochondriacal, somatoform, and other symptoms [2,23,26,37]. Some authors say that masked states dominate, manifested as cardiovascular and gastroinstestinal disorders against a background of fear and anxiety, heightened fatigability, depressed mood, emotional lability, and recurrent seismophobias [29]. The psychopathological states of the subacute period do not differ in any way from the pathological states encountered in normal psychiatric practice [16].

The third period (chronic), or that of remote consequences, begins in the sixth to seventh month after the trauma and can last for several decades [1]. There is a fixation on the experienced reactions, pathological personality traits are formed, and chronic psychopathological symptoms put in an appearance on the basis of the victim's emotional and cognitive working over of the situation, his or her reassessment of everything that has taken place, and a peculiar kind of computation of moral and physical losses. Disorders in this period are regarded as part of a unitary process, and their nature and dynamics are determined by the particular features of the extreme situation: the personality typology characteristics of the victims and the nature and scale of the personally significantly mentally traumatizing factor. The most serious conditions were noted in people who had lost relatives, their homes, and their belongings [1,23,33,36]. Reactive states were generally neurotic, and monotypical states and a "mild" course predominated. A

spot examination revealed a high degree of hidden, latent, neurotic states that more often assumed the form of astheno-autonomic disorders [39]. Neurotic states stabilized, and all forms of mental and somatic disorders became more prominent [17,33,41].

One distinctive feature of the psychopathological disorders in the third period was their more marked systemic and organic quality, developing against a background of sluggish, inhibited, asthenic depression [4,5,36]. Compulsive recollections, guilt feelings, loss of hope that one's former life would be restored, and distinctly pathological sensations that lent a certain somatoform quality to the patient's state predominated. As reactive states developed, many neurotic disorders assumed somatic form: somatoform disturbances became more intense, depressive disorders evolved under a somatic mask, and there was an increase in functional-somatic disorders [1,4,15,26,29–31,36,37].

The nature of psychogenic disorders, the likelihood that they will occur, and their frequency, their provenance, and their dynamics depend on many factors (age, premorbid history, where the victim was during the earthquake, the circumstances, physical injury, and additional psychogenic factors). Iu.A. Alcksandrovskii and co-workers [4,6] and Iu.V. Nazarenko and associates [33] have identified three types of factors that are significant for the genesis of psychogenic disorders: (*1*) the characteristics of the extreme situation (intensity, suddenness, duration of action); (*2*) individuals' ability to act under extreme conditions, their psychological stability, their stamina of will and body; and (*3*) support from others [4,6,33].

The prominence, the depth, and the stability of mental disorders are, for the most part, directly related to the nature and scale of the personally significant mentally traumatizing factor. As has been noted, severe mental disorders were characteristic of people who have suffered most heavily (materially and morally). The severity of the psychopathological symptoms showed a dependence on the presence of physical injury, its extent, the distinctive features of the course of the traumatic illness, physical disorders (in particular, functional disorders of the kidneys), cerebral hypoxia, and other exogenous and somatogenic harmful factors in the anamnesis [7,14,19,35].

A study of patients in somatic hospitals and wards to which the earthquake victims were taken indicated that hypoxia of the brain and soft tissue injury (crash syndrome), accompanied by kidney dysfunction, were among the pathogenic mechanisms in the development of psychopathological symptoms [7,14,32]. The presence of physical trauma aggravated the course of psychogenic reactions and caused mental disorders in the form of disordered consciousness, marked motor disorders, perceptual disorders, hypnogogic symptoms, aggravated ailments, and hyperesthesia; it deepened asthenia, produced severe forms of paranoid and apathetic depression, and contributed to the formation of organic brain syndromes [7,14,32]. The serious conditions were characterized mainly by syndromes of disordered consciousness.

Some role in the formation of psychopathological disorders is ascribed to genetic and familial somatic and neuropsychiatric illnesses and premorbid personality traits (the significance of emotionally unstable and anxious-apprehensive types is stressed). This is confirmed, in particular, by the fact that transitory developmental disorders in the form of infantile fears, depersonalization and derealization disorders, and pubertal crises were found in the anamneses of 71% of the victims. None of them had ever been treated by psychiatrists previously [25]. Factors associated with personality type also played a role in shaping slowly evolving psychogenic states. These factors left an imprint on the cognitive aspect of reactions to an extreme situation, but not on their form. In acute life-threatening situations, personal distinctiveness is eclipsed, and the reactions of the victims are determined by vital mechanisms [5]. The possibility that reactive states may develop in people with a normal premorbid history is not ruled out if there have been some especially serious, recurrent, mental traumas.

Clinical symptoms depended on age. In early childhood (three to four years) there were undifferentiated reactions of fear and anxiety, motor excitation or inhibition, autonomic reactions, and speech disorders. In the preschool period (four to seven years), mental disorders were more differentiated, and specific anxious-phobic reactions evolved against a background of depression and somato-autonomic dysfunctions. At school age (7–15 years), chronic mental disorders (1.5 times more frequent than in preschoolers) evolved in the form of anxious-phobic and depressive hysteroid-autonomic vascular and other somatic disorders. Beyond fifteen years, distinct depressive asthenic and anxious-phobic disorders were more frequent. Fears, sleep disorders, appetite disorders, capriciousness, and tearfulness were observed in school-age children with compound injuries. Two to three months

after the earthquake, against a background of marked asthenic disorders, anxiety, groundless nocturnal and diurnal fears, and sometimes seismophobia were noted. After five to six months, tearfulness, depression, and asthenization predominated among girls, whereas boys tended to be high-strung, superalert, and distractible [9,25,53]. At a later age, depressive disorders predominated [38].

In addition to neurotic (and neurosislike) disorders, there were also psychotic disorders. Mild and nonpathological preneurotic symptoms were formed when professional and psychophysical training did not correspond to the actual life conditions and the extreme situation and when there was an absence of positive emotions. If the significant mental trauma became chronic and the victim was unable to define a role in life, neuroses developed. Under the influence of intensive and sudden external factors and insufficient individual psychological preparation, neurotic reactions and reactive psychoses developed. The latter were observed mainly in the acute period in the form of affective-shock reactions with twilight clouding of consciousness, stupor, or motor disinhibition or hysterical psychoses and depressive and psychomotor expressive reactions [11,20,40,52].

As has been pointed out, reactions to mental trauma are defined in DSM-III-R as post-traumatic stress disorders and given the status of a general diagnostic category that has become widespread in the English-speaking literature. The criteria for PTSD are recurrent, subjective experiences of trauma, slowed reactions, and a set of heterogeneous symptoms [42]. At the clinical-dynamic level, acute, chronic, and delayed PTSD are distinguished [22]. Acute PTSDs are characterized by fixation on the trauma experienced, reduced reactiveness, cognitive and autonomic disorders, and mood swings. Acute PTSDs occur following cessation of the immediate influence of the disaster. Delayed PTSDs are clinically similar to acute PTSDs, the only differences being in the time of onset. The latter typically have a certain symptom-free period. Acute PTSD can develop into a chronic form [22]. In addition to the symptoms mentioned above as proper to mental disorders occurring after earthquake, many patients with PTSD have described experiences with special, recurrent, stereotyped "themes" [51]. These include, for example, a constant fear that the traumatizing event will recur in reality or in nightmares; shame about one's own apparent helplessness in the face of earthquakes or about avoiding one's usual responsibilities because of the trauma suffered;

identification with someone who has died or who has suffered; rage at the injustice of fate, at people, or at social institutions thought to bear responsibility for what has happened; a sense of guilt for not being able to prevent the event or at least reduce its negative consequences; dejection and a dampened spirit because of the losses of loved ones, property, or some other loss; flight from, or avoidance of, a situation; and an abrupt bout of relative ill-humor in the face of events recalling the traumatizing event. The basic and most characteristic symptoms are vivid, graphic, compulsive experiences of the trauma in recollections and ideas and in nightmares and stereotyped dreams; panic attacks; impaired concentration and memory lapses; sleeplessness; and emotional disorders accompanied by a desire for isolation and for restricting contacts with the external world [42,50–52,55]. Thus, according to Kraepelin's paradigm [28] (currently the prevailing one in psychiatry) on nosological units, based on three criteria (symptoms, course, and outcome), one can speak of reactive states, but not of PTSD, that have more of an operational than clinical-nosological sense. But some of the foundations of Kraepelin's conception now require reassessment.

Strong earthquakes are capable of causing "a pandemic of neuropsychiatric traumatism" [11]. Despite the absence of clear differential diagnostic criteria and standard methods of epidemiological research, virtually all authors mention the extensive prevalence of mental disorders. In addition, there is almost a twofold increase in the number of hospitalizations in psychiatric hospitals and a considerable increase in neurosis morbidity. Reactive disorders have been found in 70%–90% of victims, judging from data from the Skopje, Tashkent, and Spitak earthquakes [1,4,13,33,40,52,58]. However, only half of them needed psychiatric care, and only 11% of the victims thought they needed such care and rated their state as pathological [31]. The number of people needing psychiatric care is much higher than indicated in the literature. Indirect evidence of this is the increase in the use of alcohol and narcotics and survey findings that some victims preferred to visit internists for similar problems or did not take advantage of this possibility at all [22].

Psychiatric and medico-psychological care is a necessary aspect of an overall system of general medical measures. Its principal tasks are to halt acute psychotic reactions, screen people for psychoneurological disorders, and organize gradual, step-by-step treatment and medico-

psychological support of the population in disaster areas [3]. The basic principle in providing care to victims is step-by-step screening, evacuation, and an appropriate treatment. This care is designed to conform to the periods in the development of the situation. Three periods are distinguished on the basis of specific features of life-saving and social and medical measures: (*1*) from onset of the earthquake to the beginning of the salvage work; (*2*) the period of development of salvage work; (*3*) the period after evacuation from the disaster zone [6,57]. The strategy of psychiatric care depends on the dynamics of the mental disorders. It must be closely correlated at all stages with general medical assistance, and continuity of preventive, therapeutic, and rehabilitative measures should be ensured.

Thus, the problem of mental disorders occurring after powerful earthquakes is of major theoretical and practical significance. Many aspects of this problem remain unresolved because of the lack of a unified conceptual approach.

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